

## ABSTRACT

An automatic frequency control (AFC) system applies in a mobile station for automatically controlling a local frequency signal to be substantially synchronized with an input signal which is a first received signal  $S_H$  from a base station, and for being capable of shifting the frequency of the local frequency signal to be close to that of a second received signal  $S_{new}$  from another base station when the input signal is changed from the first received signal  $S_H$  to the second received signal  $S_{new}$ . The AFC system comprises a control module, a memory unit, and an automatic frequency controller. The memory unit stores a plurality of AFC parameter sets; each AFC parameter set corresponds to a base station within the wireless cellular system. When the input signal  $S_I$  is changed from the first received signal  $S_H$  to the second received signal  $S_{new}$ , the control module fetches the AFC parameter set, which corresponds to the second base station, from the memory unit; it then applies the fetched AFC parameter set, which corresponds to the second base station, to the automatic frequency controller to shift the frequency of the local frequency signal  $f_L$  to be close to that of the second received signal  $S_{new}$  from another base station.